Water Conditions Summary

Operations Control, Engineering & Vegetation Management Department

Operations & Maintenance Resource Area

Governing Board Presentation

May 15, 2003

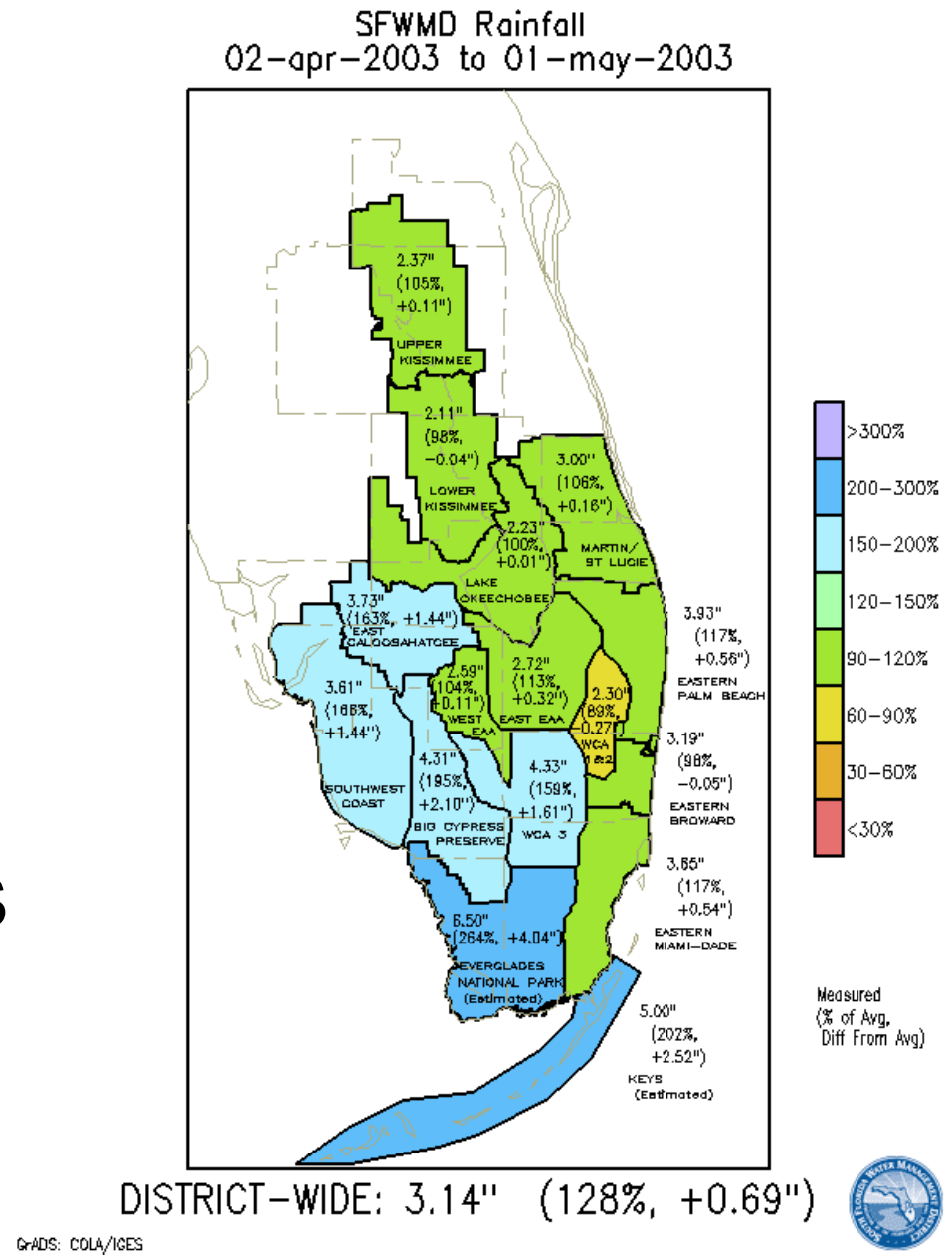
Meteorological Conditions

Governing Board Presentation - May 15, 2003

Meteorological Conditions

- District-wide rainfall in April continued the trend of slightly above average rainfall
- April Rainfall : District-wide rainfall was 128% of average
  - Normal Rainfall: 2.45 inches
  - Actual Rainfall: 3.16 inches
  - Est. Pan Evaporation: 5.7 inches
- May Rainfall : District-wide rainfall to-date is approximately 15% of average

- Most areas of the District received average rainfall in April
- Heaviest rain focused in the Caloosahatchee Basin, Everglades National Park and Florida Keys



General Hydrologic Conditions

Governing Board Presentation - May 15, 2003

General Hydrologic Conditions

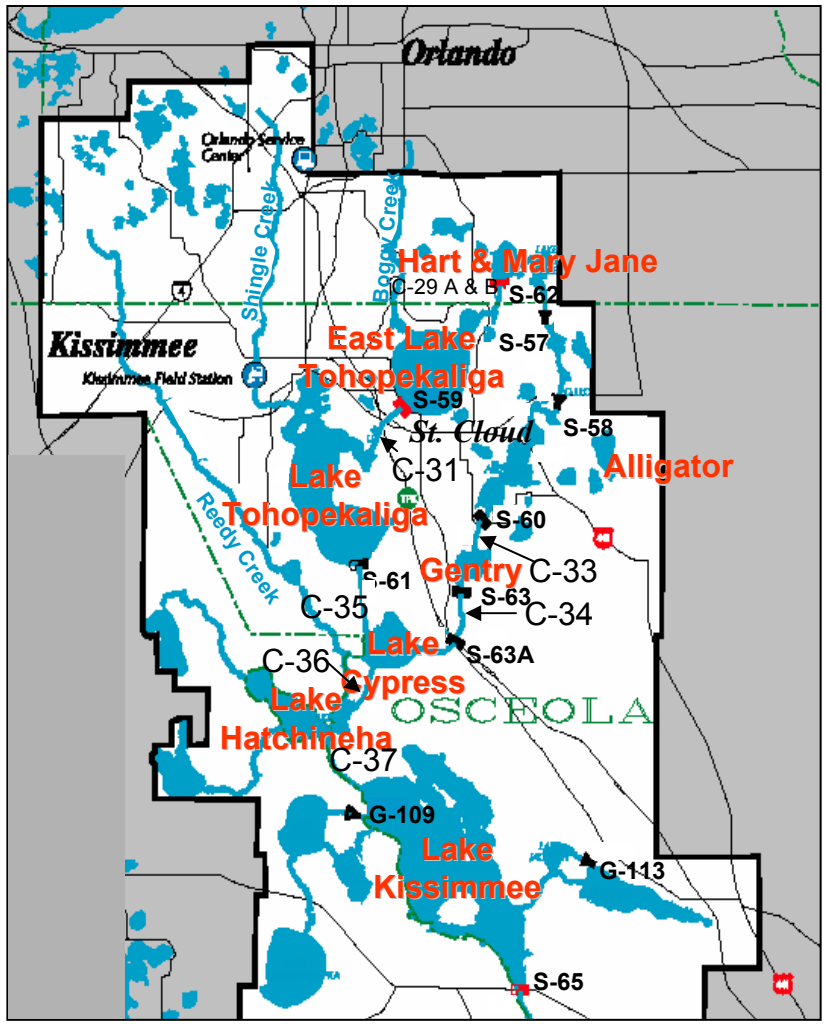
- G **Upper Chain** – Normal levels
- G **Kissimmee River** - Normal seasonal flows
- Y **Lake Okeechobee** - Above desirable stage
- G **Lake Okeechobee Agriculture**
- G **Estuaries** – Normal seasonal salinity

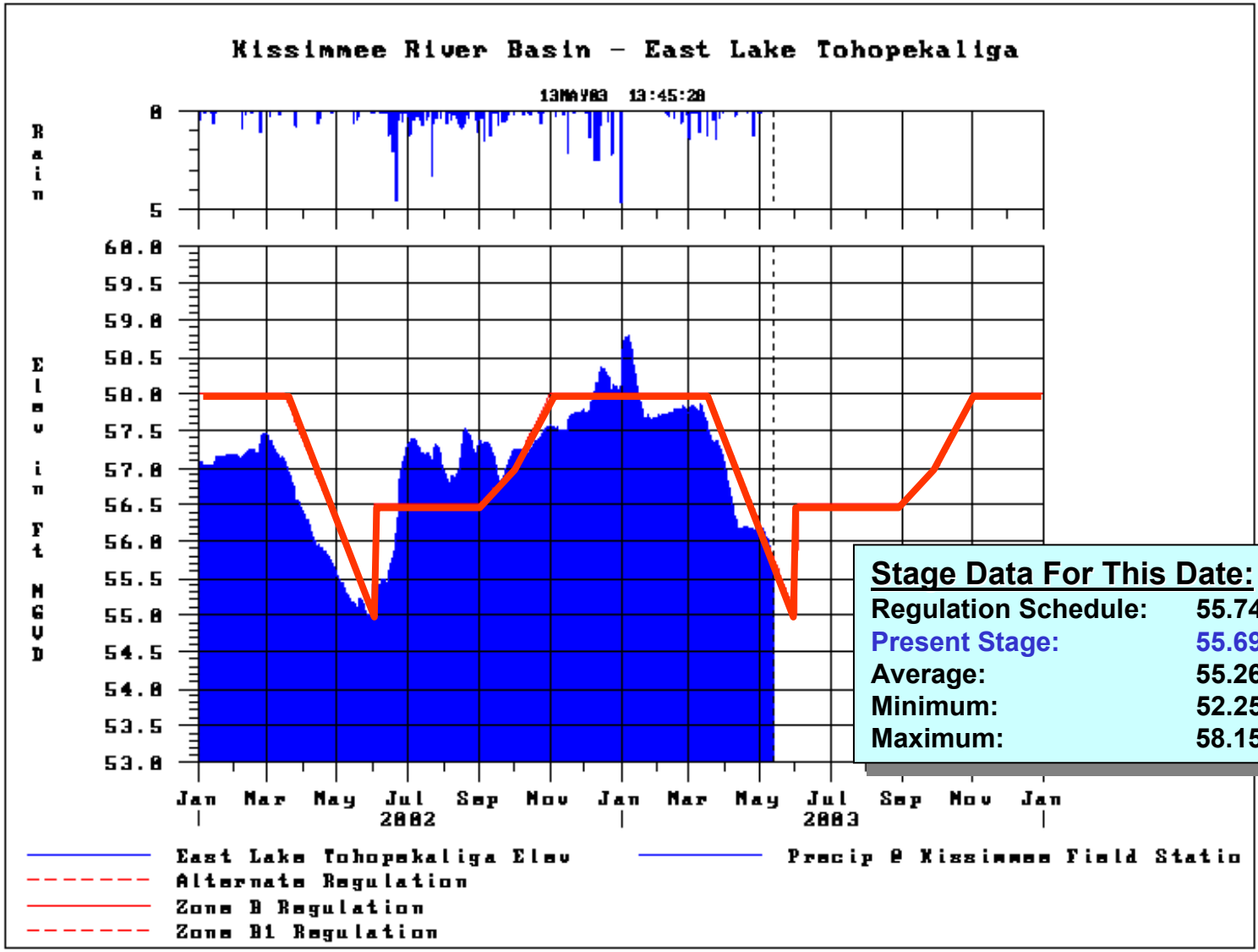
General Hydrologic Conditions

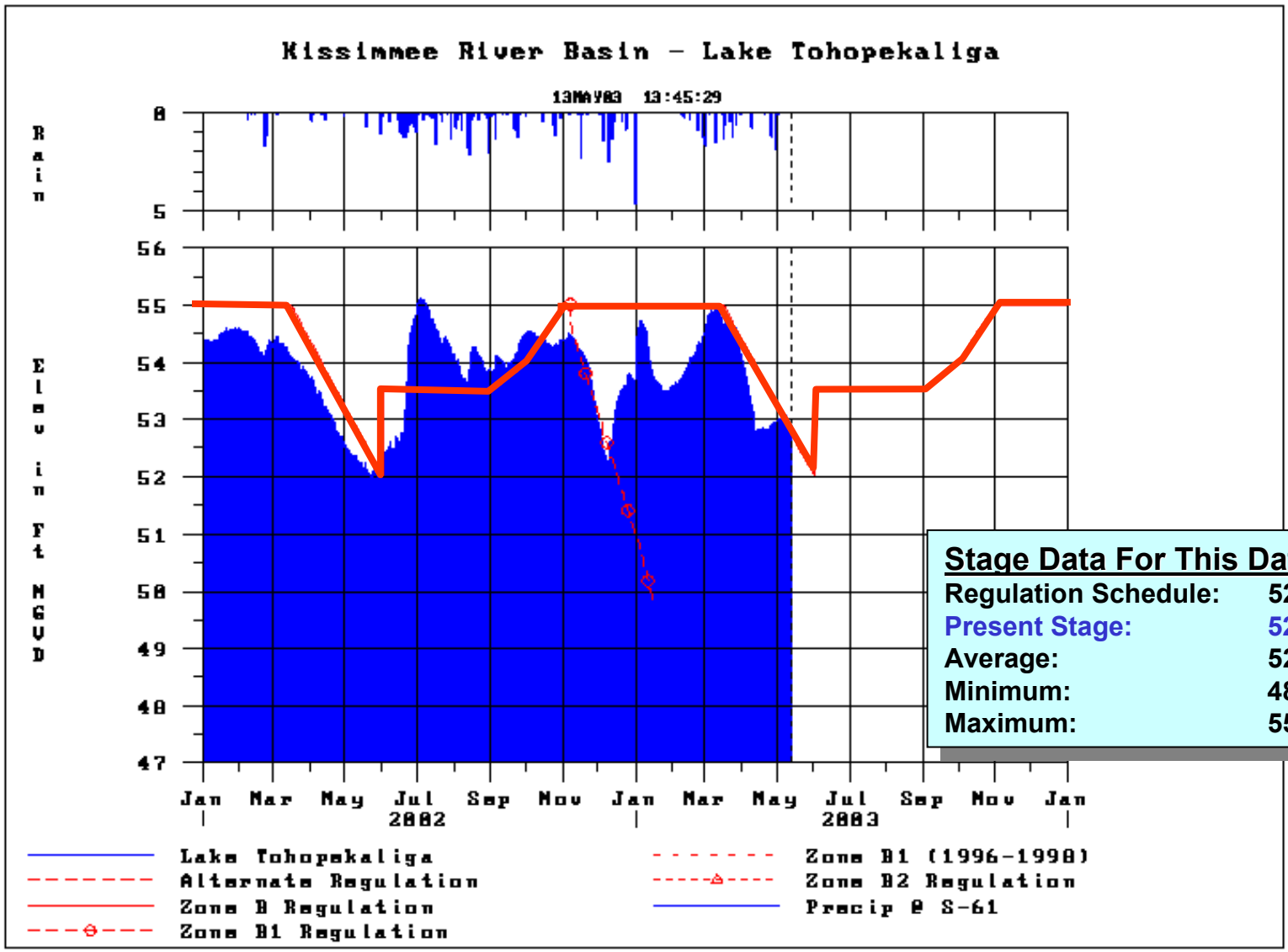
- **Water Conservation Area 1** - Near Sched.
- **Water Conservation Area 2** - Near Sched.
- **Water Conservation Area 3** - Near Sched.
- **ENP** - Normal seasonal conditions
- **Fl. Bay** - Normal seasonal conditions
- **Upper East Coast** - low canal levels
- **Lower East Coast** - Norm. seasonal grndwtr.
- **Lower West Coast** - Norm. seasonal grndwtr.

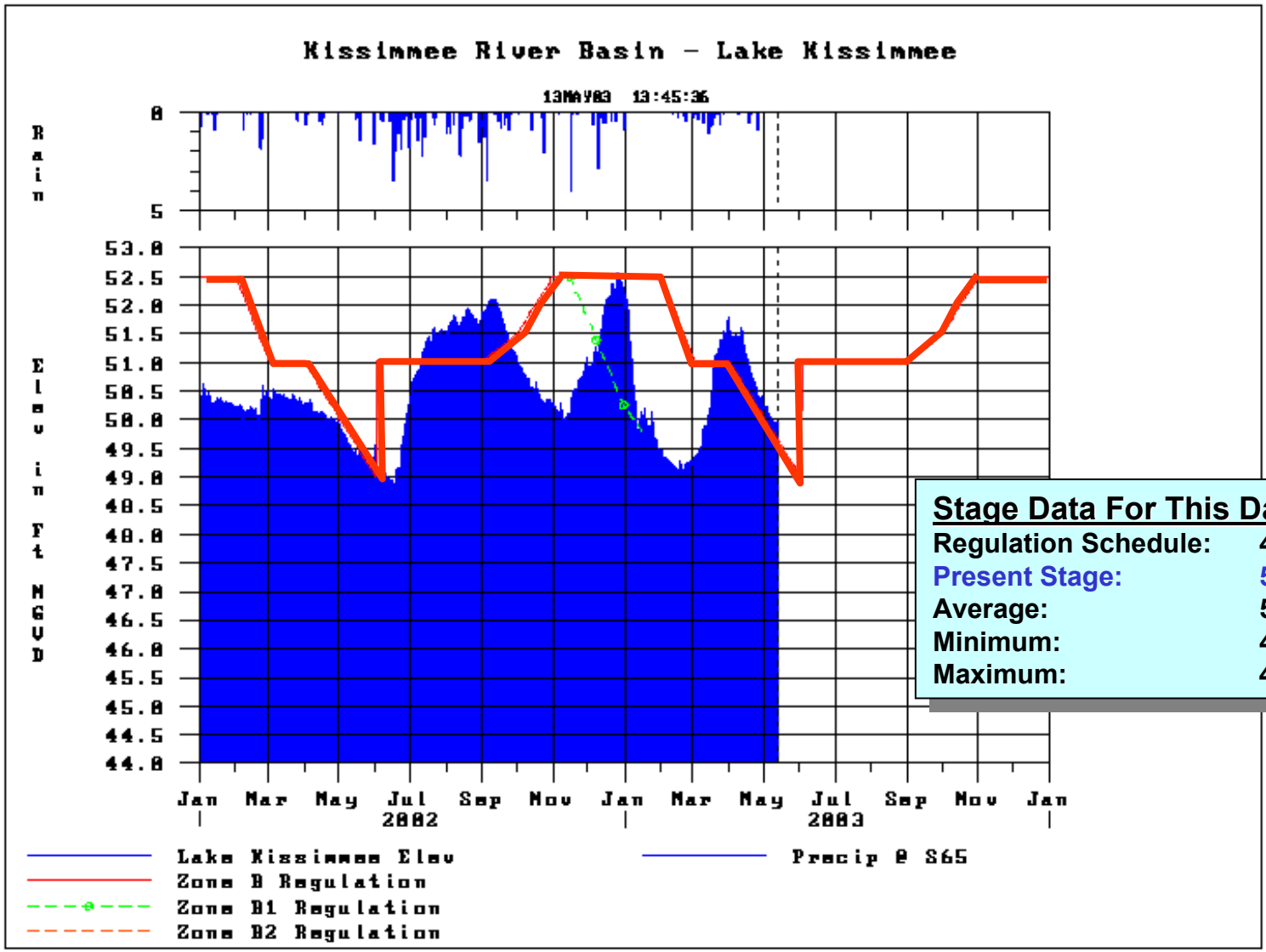
Hydrologic Conditions
Upper Kissimmee Basins

- Structures at most lakes have initiated regulatory releases to lower stages
  - This helps ensure that lakes will have adequate storage available to accept inflows at the start of the wet season in June
- Lake Toho Hydrilla Treatment
  - USACE, approved a temporary deviation to facilitate the project

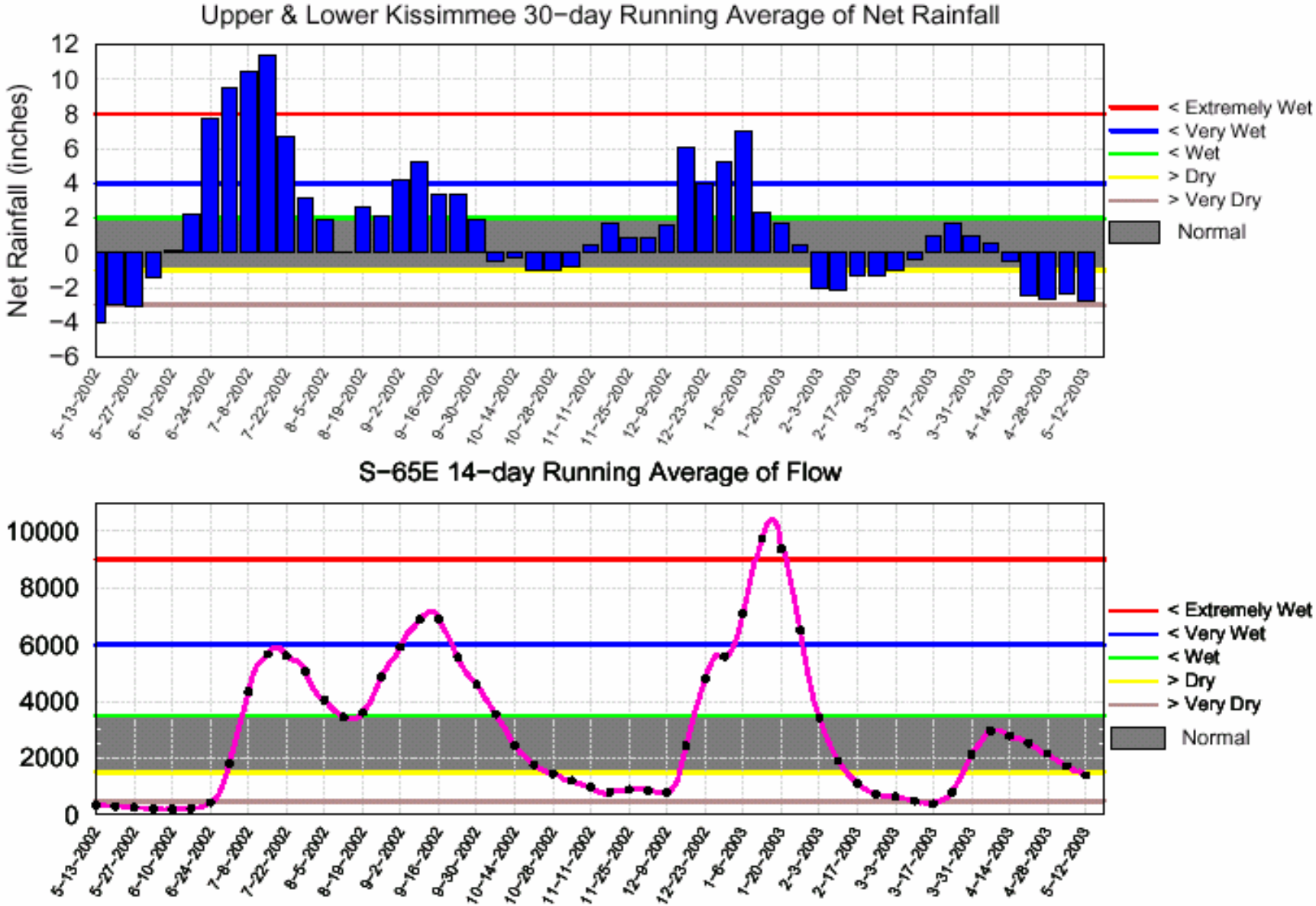



Kissimmee River Basin - East Lake Tohopekaliga
13MAY03 13:45:28
Rain
0
5
Elev in Ft NGVD
60.0
59.5
59.0
58.5
58.0
57.5
57.0
56.5
56.0
55.5
55.0
54.5
54.0
53.5
53.0
Jan Mar May Jul Sep Nov Jan Mar May Jul Sep Nov Jan
2002
2003
East Lake Tohopekaliga Elev
Precip @ Kissimmee Field Statio
Alternate Regulation
Zone B Regulation
Zone B1 Regulation
Stage Data For This Date:
Regulation Schedule: 55.74
Present Stage: 55.69
Average: 55.26
Minimum: 52.25 (1962)
Maximum: 58.15 (1960)


Kissimmee River Basin - Lake Tohopekaliga
13MAY03 13:45:29
Rain
0
5
Elev in Ft NGVD
56
55
54
53
52
51
50
49
48
47
Jan Mar May Jul Sep Nov Jan Mar May Jul Sep Nov Jan
2002
2003
Lake Tohopekaliga
Alternate Regulation
Zone B Regulation
Zone B1 Regulation
Zone B1 (1996-1998)
Zone B2 Regulation
Precip @ S-61
Stage Data For This Date:
Regulation Schedule: 52.74
Present Stage: 52.83
Average: 52.42
Minimum: 48.72 (1971)
Maximum: 55.83 (1960)

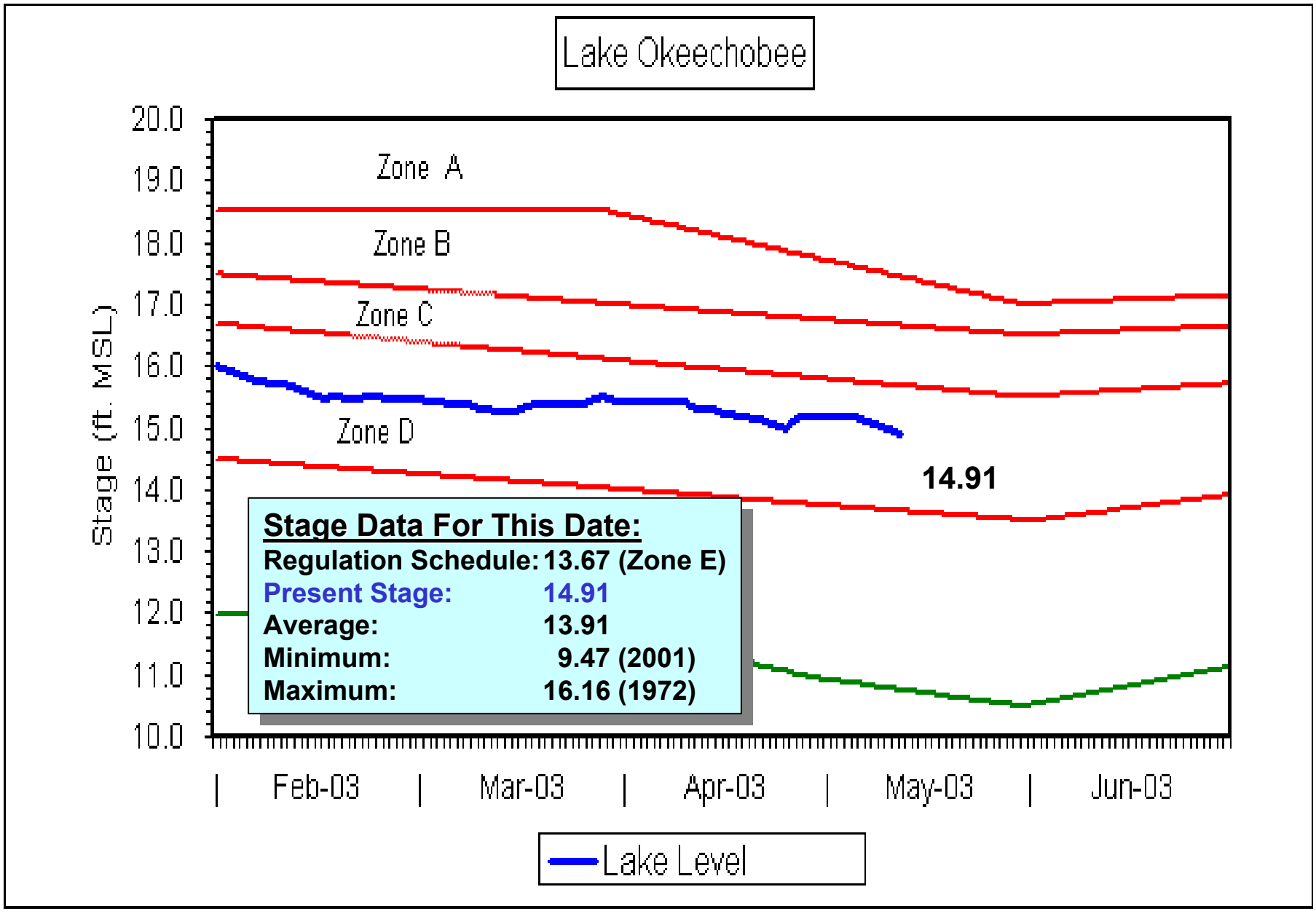

Kissimmee River Basin - Lake Kissimmee
13MAY03 13:45:36
Rain
0
5
Elev in Ft NGVD
53.0
52.5
52.0
51.5
51.0
50.5
50.0
49.5
49.0
48.5
48.0
47.5
47.0
46.5
46.0
45.5
45.0
44.5
44.0
Jan Mar May Jul Sep Nov Jan Mar May Jul Sep Nov Jan
2002
2003
Lake Kissimmee Elev
Zone B Regulation
Zone B1 Regulation
Zone B2 Regulation
Precip @ S65
Stage Data For This Date:
Regulation Schedule: 49.62
Present Stage: 50.15
Average: 50.07
Minimum: 49.37 (1973)
Maximum: 43.40 (1977)

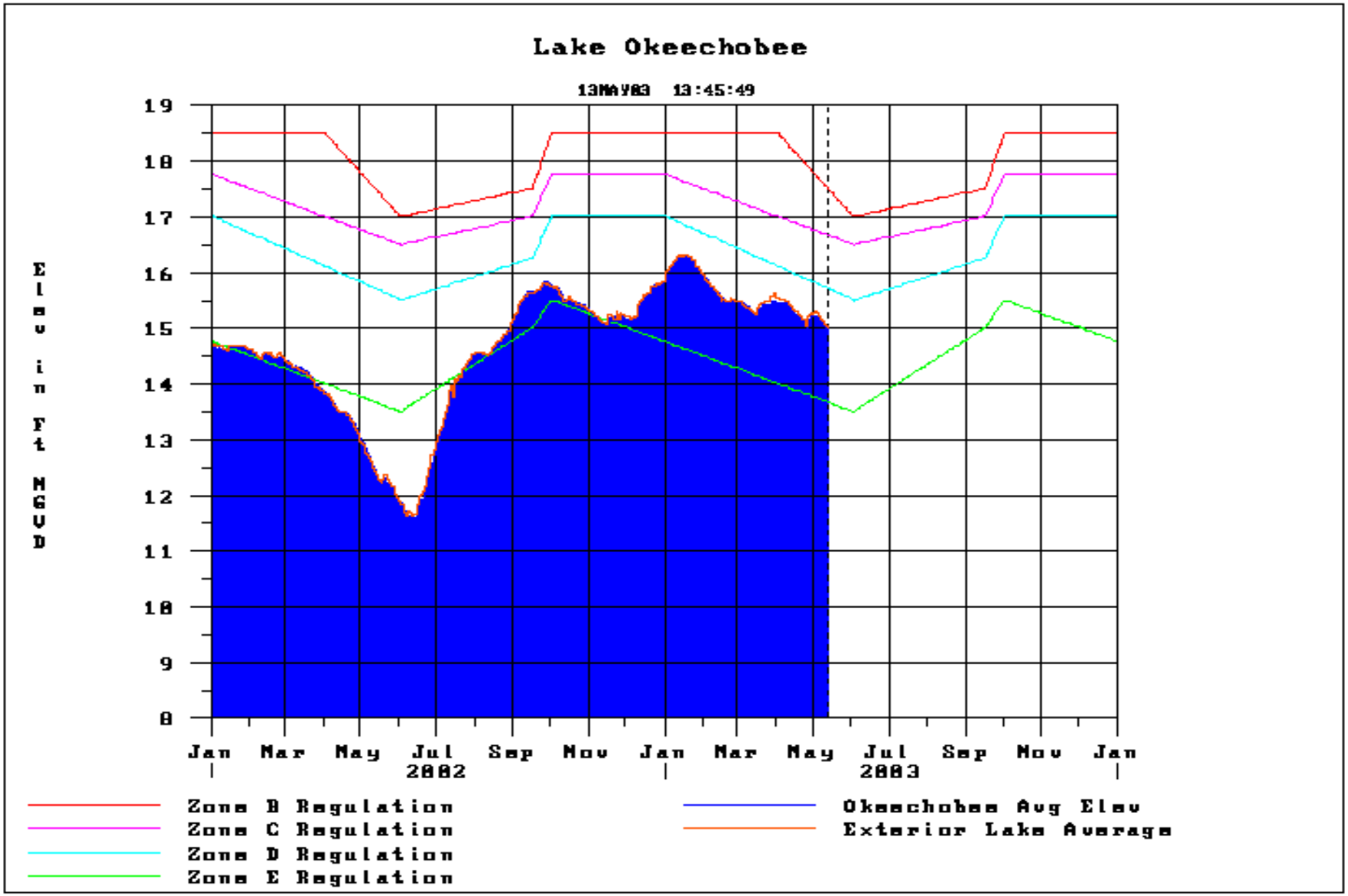
Tributary Basin Condition Indicators as of May 12, 2003



Hydrologic Conditions
Lake Okeechobee

- Lake Okeechobee stages have begun to fall in response to typical dry season conditions in the tributary basin
- Stages in the lake were above 15 ft NGVD for a period of about 8 months, between September 2002 and early May 2003
  - This condition is characterized as a having a “moderate probability of adverse impact” in the Adaptive Protocols for Lake Okeechobee Operations
  - Stages are not expected to reach the ecologically desired stage of 13.5 ft. by June 1st
- Currently making Level I Pulse
- High agricultural irrigation demands

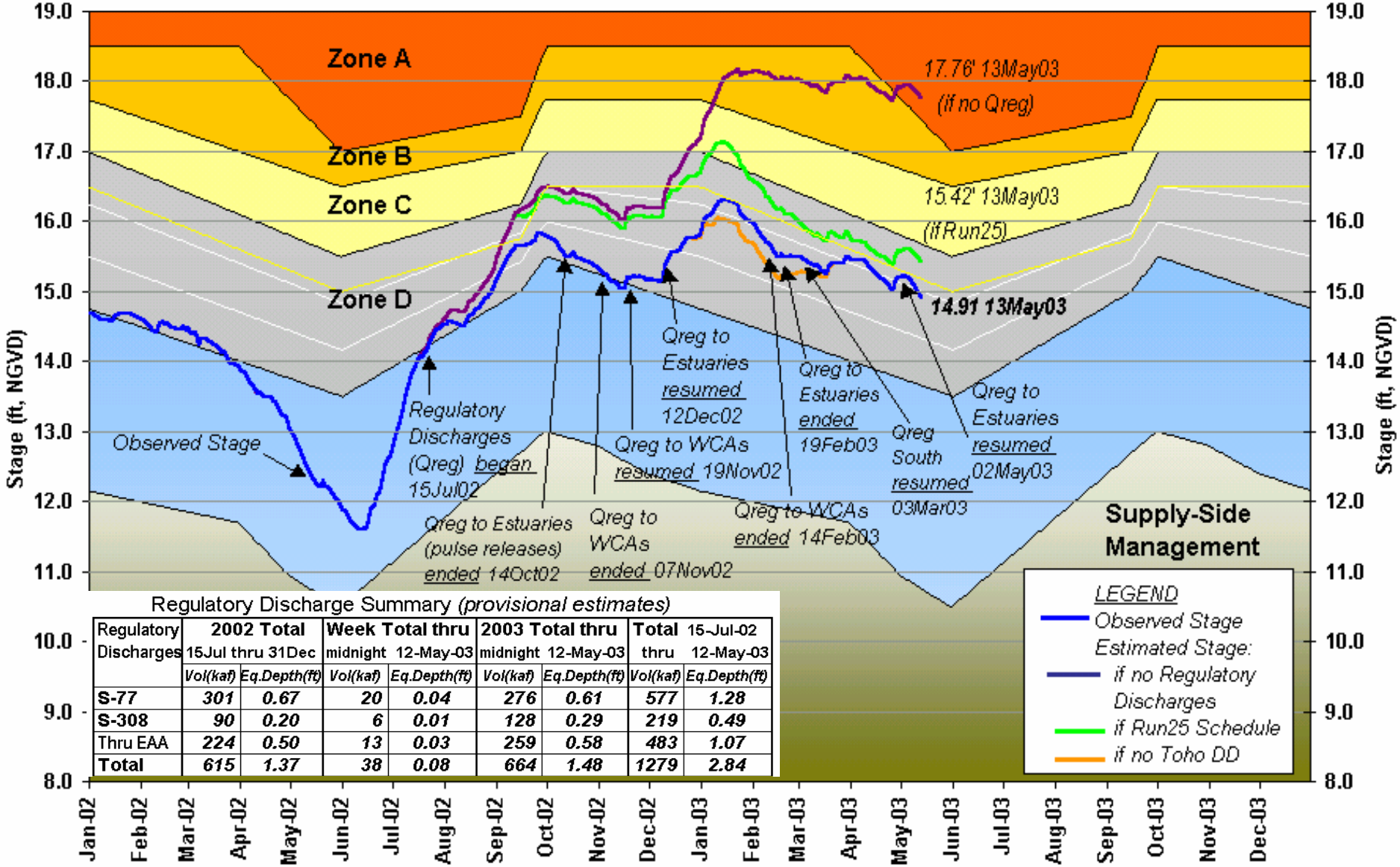

Lake Okeechobee
Stage (ft. MSL)
20.0
19.0
18.0
17.0
16.0
15.0
14.0
13.0
12.0
11.0
10.0
Zone A
Zone B
Zone C
Zone D
14.91
Stage Data For This Date:
Regulation Schedule: 13.67 (Zone E)
Present Stage: 14.91
Average: 13.91
Minimum: 9.47 (2001)
Maximum: 16.16 (1972)
Feb-03
Mar-03
Apr-03
May-03
Jun-03
Lake Level


Lake Okeechobee
13MAY03 13:45:49
Elev in Ft NGVD
19
18
17
16
15
14
13
12
11
10
9
8
Jan
Mar
May
Jul
Sep
Nov
Jan
Mar
May
Jul
Sep
Nov
Jan
2002
2003
Zone B Regulation
Zone C Regulation
Zone D Regulation
Zone E Regulation
Okeechobee Avg Elev
Exterior Lake Average

Lake Okeechobee Current Operations

- **Regulation Schedule**
  - **Stage presently in Zone D**
  - *Dry* inflow conditions
  - *Dry* rainfall conditions
  - *Wet* seasonal forecast
  - *Normal* multi-seasonal forecast
- **Discharge to the WCAs**
- **Level I Pulse to estuaries**

Lake Okeechobee Stage Comparison

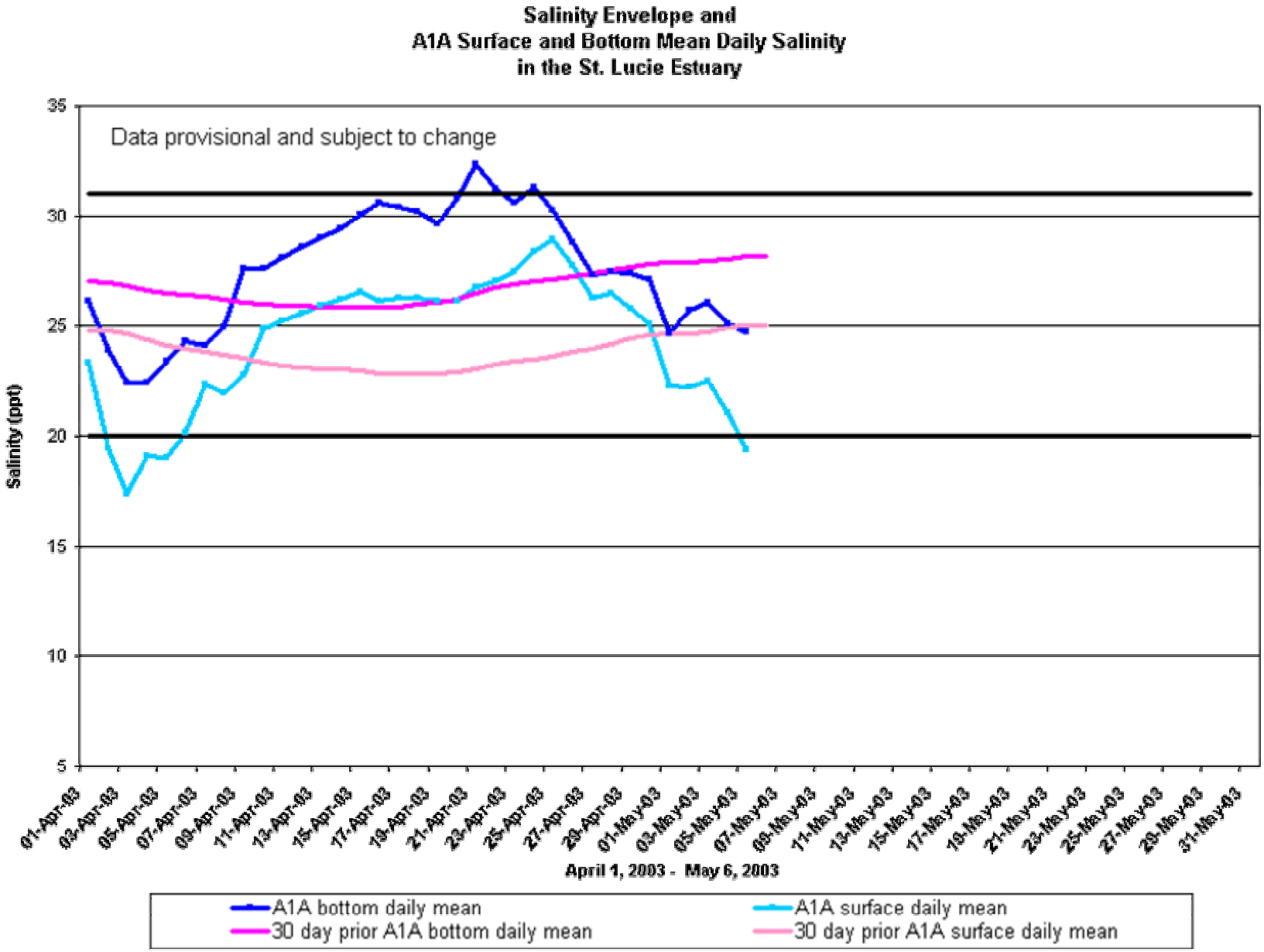


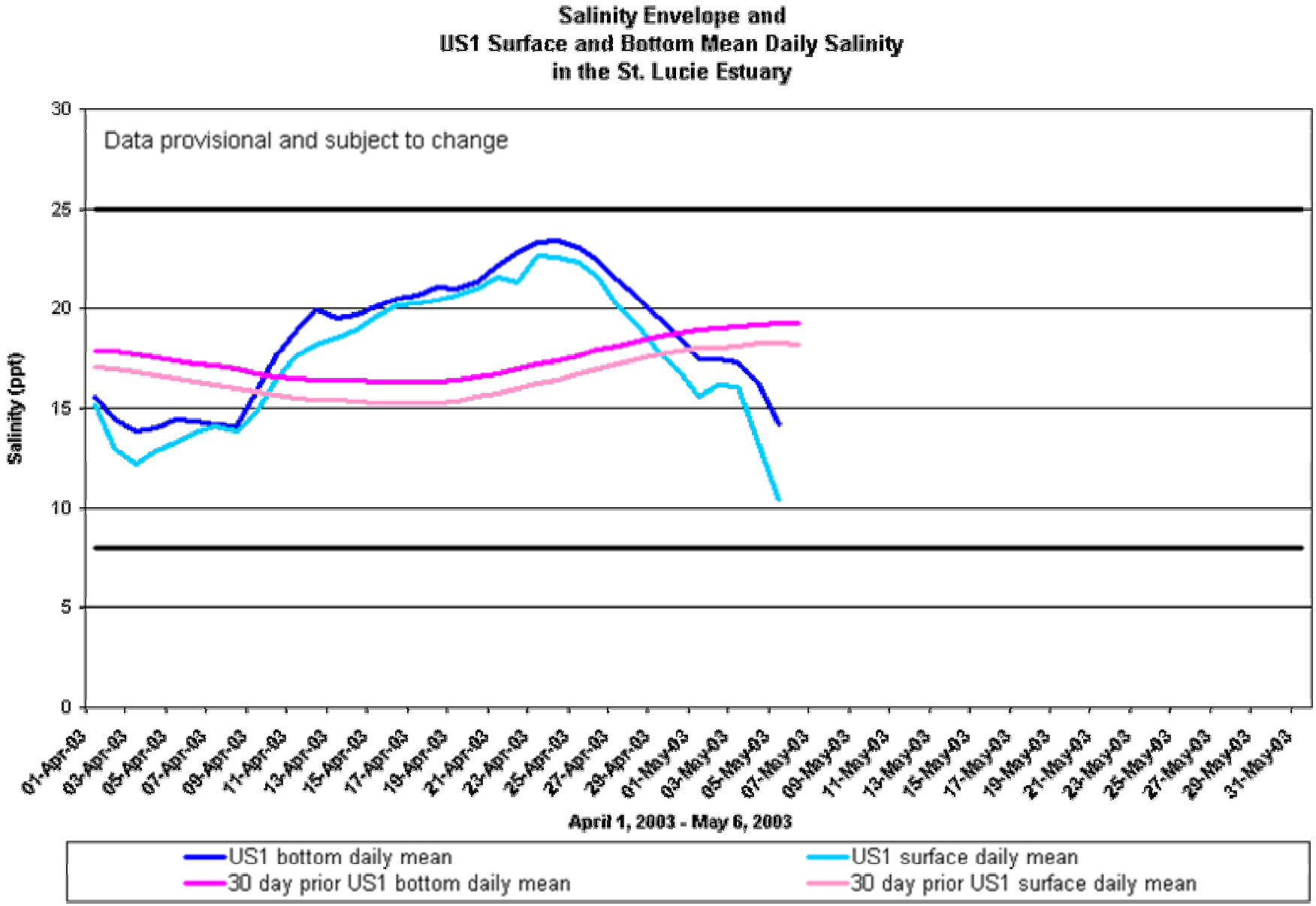
Regulatory Discharge Summary *(provisional estimates)*

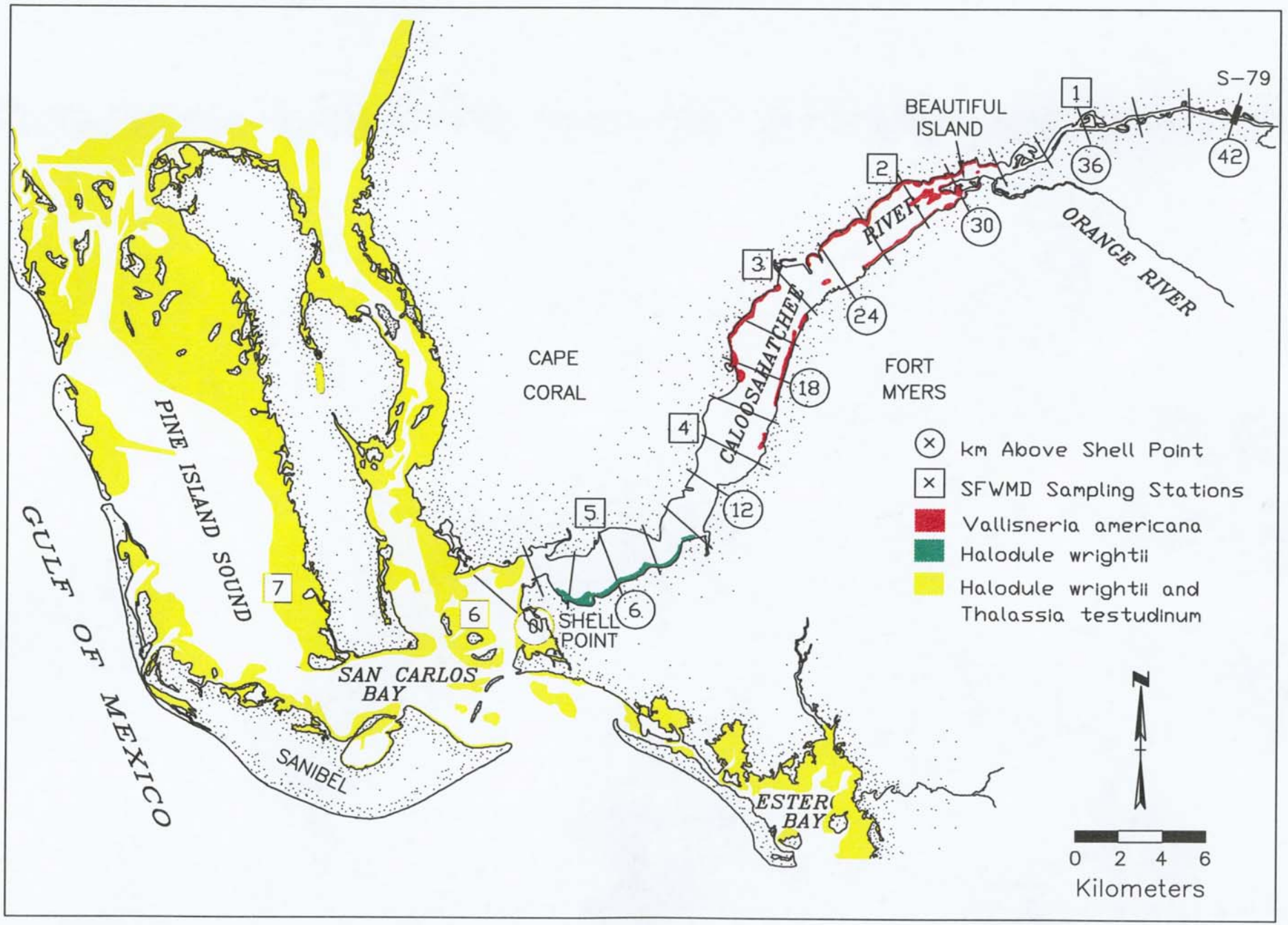
Regulatory Discharges	2002 Total 15Jul thru 31Dec		Week Total thru midnight 12-May-03		2003 Total thru midnight 12-May-03		Total 15-Jul-02 thru 12-May-03	
	Vol(kaf)	*Eq.Depth(ft)*	*Vol(kaf)*	*Eq.Depth(ft)*	*Vol(kaf)*	*Eq.Depth(ft)*	*Vol(kaf)*	*Eq.Depth(ft)*
S-77	***301***	***0.67***	***20***	***0.04***	***276***	***0.61***	***577***	***1.28***
S-308	***90***	***0.20***	***6***	***0.01***	***128***	***0.29***	***219***	***0.49***
Thru EAA	***224***	***0.50***	***13***	***0.03***	***259***	***0.58***	***483***	***1.07***
Total	***615***	***1.37***	***38***	***0.08***	***664***	***1.48***	***1279***	***2.84***

Hydrologic Conditions
St. Lucie Estuary

- As a result of the recent Level I pulse, salinity measurements near the water surface fell to the lower end of the preferred range at both the U.S. No. 1 and A-1-A sampling stations
- Salinity measurements near the bottom of the Estuary are within the preferred range at both sites

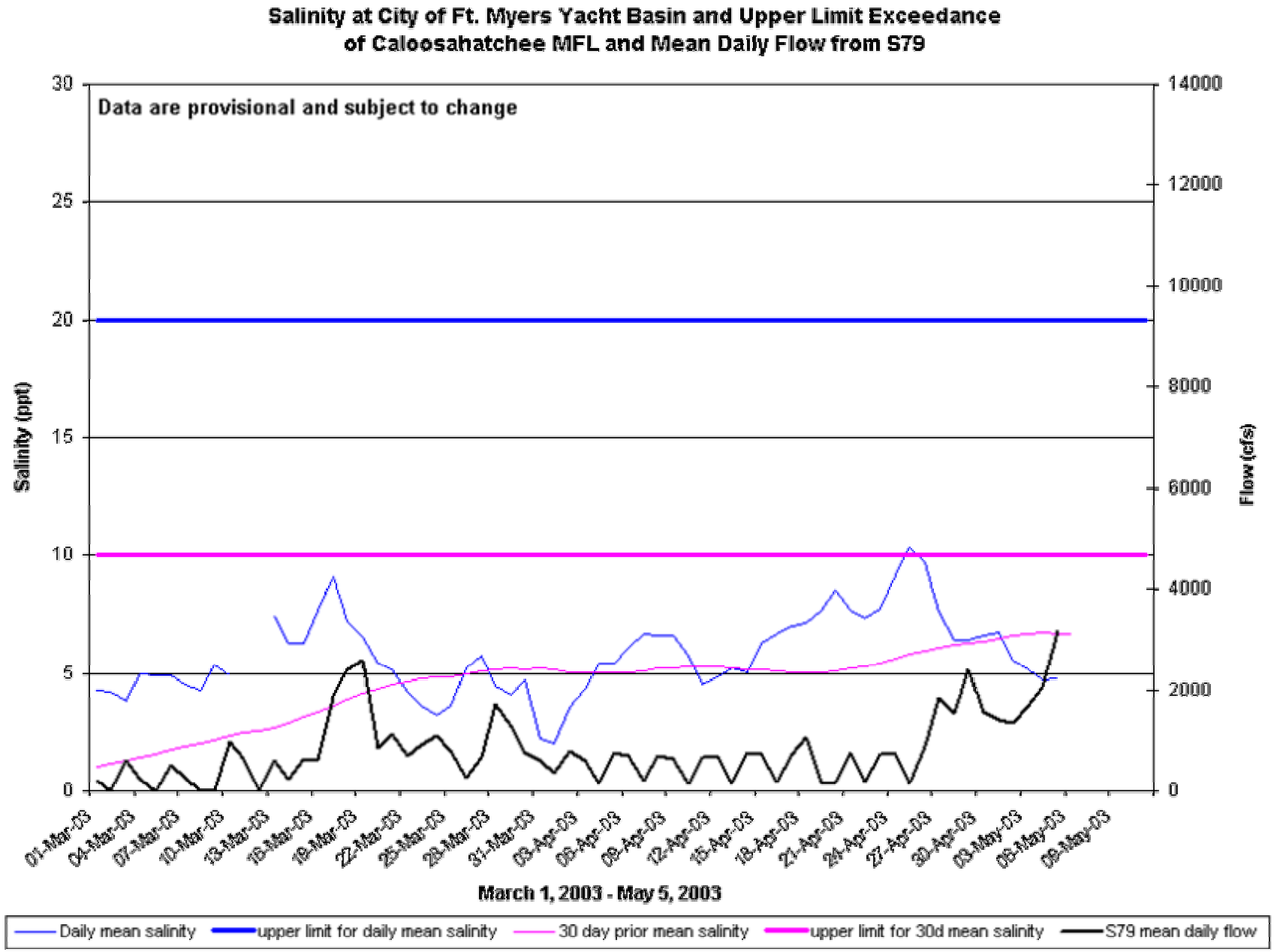

Salinity Envelope and
A1A Surface and Bottom Mean Daily Salinity
in the St. Lucie Estuary
Data provisional and subject to change
Salinity (ppt)
35
30
25
20
15
10
5
01-Apr-03
03-Apr-03
05-Apr-03
07-Apr-03
09-Apr-03
11-Apr-03
13-Apr-03
15-Apr-03
17-Apr-03
19-Apr-03
21-Apr-03
23-Apr-03
25-Apr-03
27-Apr-03
29-Apr-03
01-May-03
03-May-03
05-May-03
07-May-03
09-May-03
11-May-03
13-May-03
15-May-03
17-May-03
19-May-03
21-May-03
23-May-03
25-May-03
27-May-03
29-May-03
31-May-03
April 1, 2003 - May 6, 2003
A1A bottom daily mean
A1A surface daily mean
30 day prior A1A bottom daily mean
30 day prior A1A surface daily mean

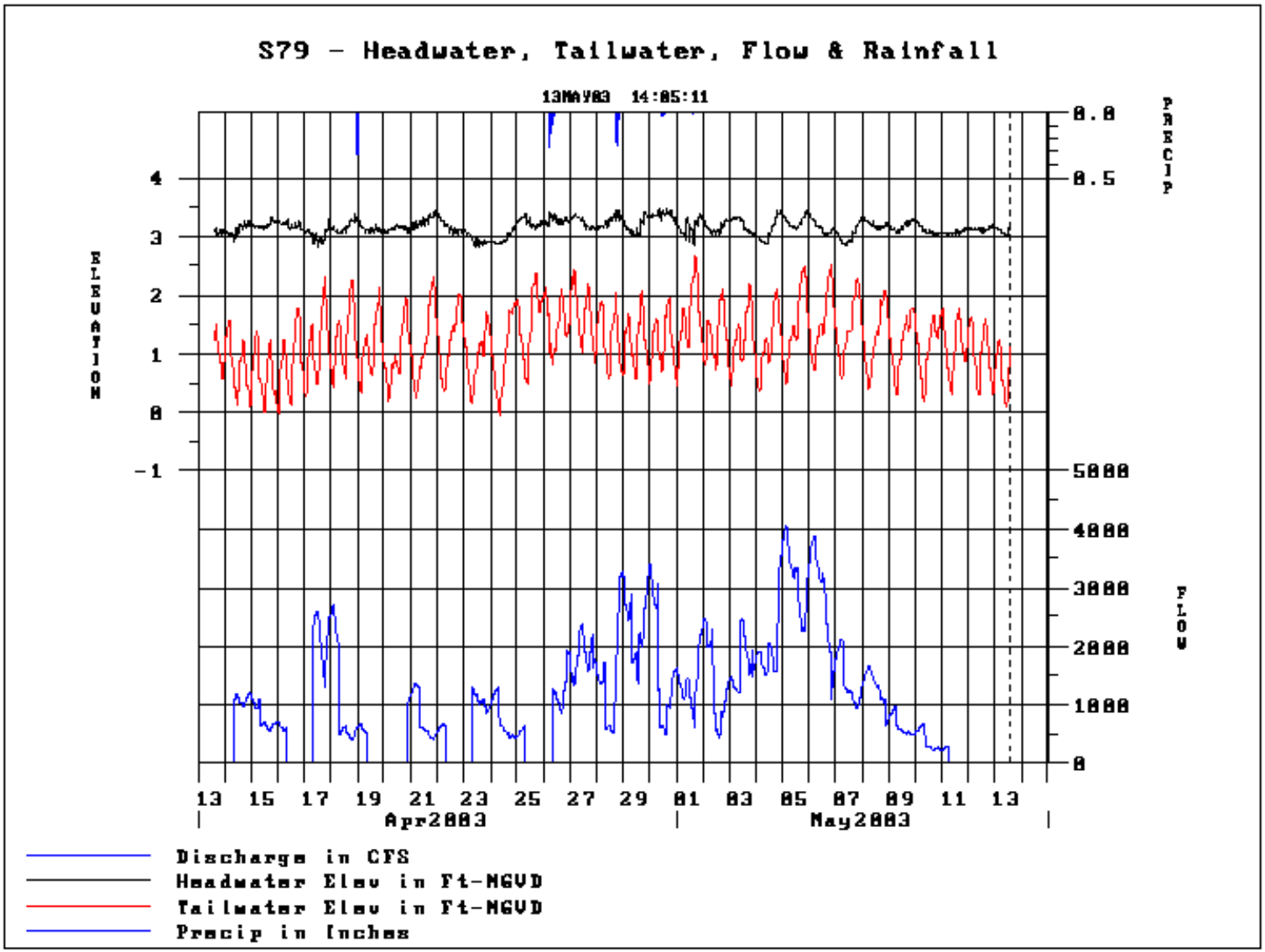

Salinity Envelope and
US1 Surface and Bottom Mean Daily Salinity
in the St. Lucie Estuary
Data provisional and subject to change
Salinity (ppt)
30
25
20
15
10
5
0
01-Apr-03
03-Apr-03
05-Apr-03
07-Apr-03
09-Apr-03
11-Apr-03
13-Apr-03
15-Apr-03
17-Apr-03
19-Apr-03
21-Apr-03
23-Apr-03
25-Apr-03
27-Apr-03
29-Apr-03
01-May-03
03-May-03
05-May-03
07-May-03
09-May-03
11-May-03
13-May-03
15-May-03
17-May-03
19-May-03
21-May-03
23-May-03
25-May-03
27-May-03
29-May-03
31-May-03
April 1, 2003 - May 6, 2003
US1 bottom daily mean
US1 surface daily mean
30 day prior US1 bottom daily mean
30 day prior US1 surface daily mean


S-79
BEAUTIFUL ISLAND
1
2
3
4
5
6
7
36
42
30
24
18
12
6
RIVER
CALOOSAHATCHEE
ORANGE RIVER
CAPE CORAL
FORT MYERS
SHELL POINT
PINE ISLAND SOUND
GULF OF MEXICO
SAN CARLOS BAY
SANIBEL
ESTERO BAY
km Above Shell Point
SFWMD Sampling Stations
Vallisneria americana
Halodule wrightii
Halodule wrightii and Thalassia testudinum
N
0 2 4 6
Kilometers

Hydrologic Conditions Caloosahatchee Estuary

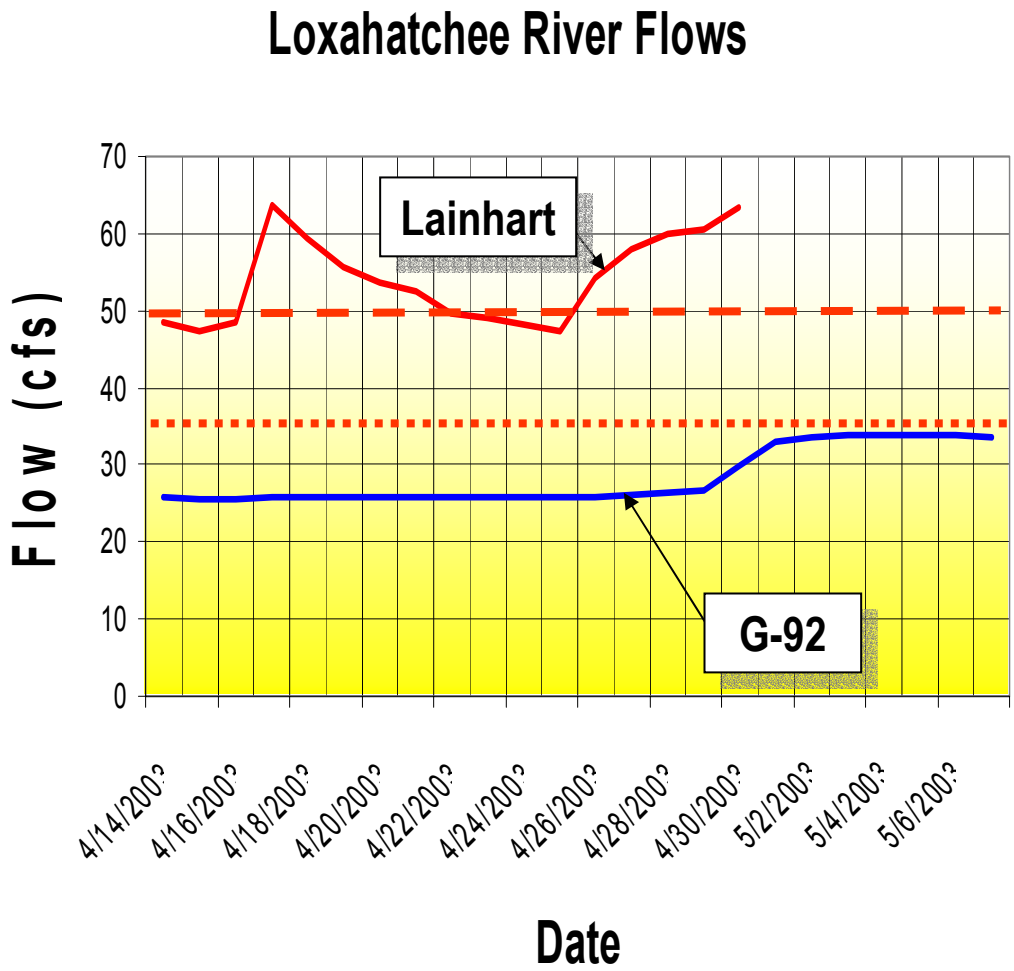
- Salinity values in the upper estuary remain within the preferred range for freshwater submerged plants
- Salinity values in the lower estuary have fallen to the lower end of the preferred range for marine submerged plants


Salinity at City of Ft. Myers Yacht Basin and Upper Limit Exceedance
of Caloosahatchee MFL and Mean Daily Flow from S79
Data are provisional and subject to change
Salinity (ppt)
Flow (cfs)
30
25
20
15
10
5
0
14000
12000
10000
8000
6000
4000
2000
0
01-Mar-03
04-Mar-03
07-Mar-03
10-Mar-03
13-Mar-03
16-Mar-03
19-Mar-03
22-Mar-03
25-Mar-03
28-Mar-03
31-Mar-03
03-Apr-03
06-Apr-03
09-Apr-03
12-Apr-03
15-Apr-03
18-Apr-03
21-Apr-03
24-Apr-03
27-Apr-03
30-Apr-03
03-May-03
06-May-03
09-May-03
March 1, 2003 - May 5, 2003
Daily mean salinity
upper limit for daily mean salinity
30 day prior mean salinity
upper limit for 30d mean salinity
S79 mean daily flow


S79 - Headwater, Tailwater, Flow & Rainfall
13MAY03 14:05:11
ELEVATION
4
3
2
1
0
-1
PRECIP
0.0
0.5
FLOW
5000
4000
3000
2000
1000
0
13 15 17 19 21 23 25 27 29 01 03 05 07 09 11 13
Apr2003
May2003
Discharge in CFS
Headwater Elev in Ft-NGVD
Tailwater Elev in Ft-NGVD
Precip in Inches

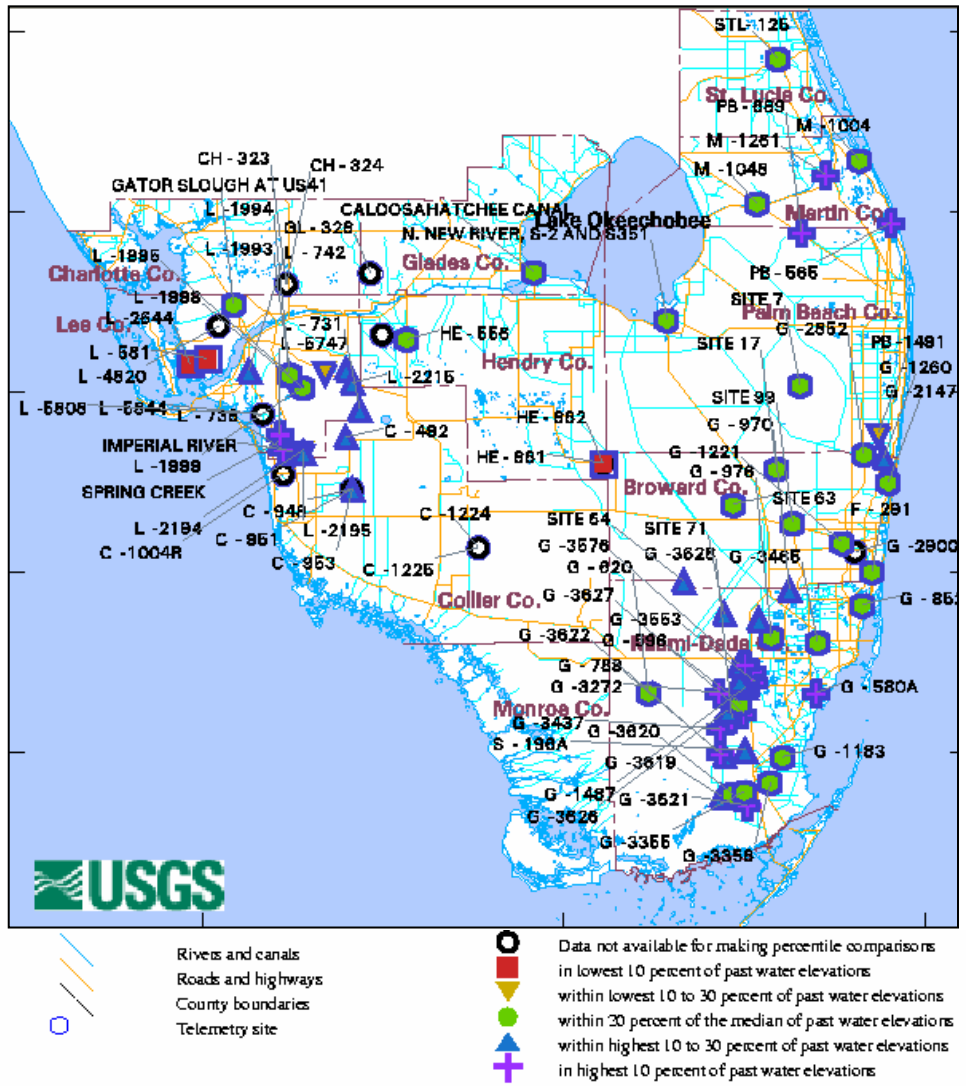
Loxahatchee River

- Recent rainfall has increased flows in the Loxahatchee River Basin
- Flow across Lainhart Dam has remains above the operational target of 50 cfs

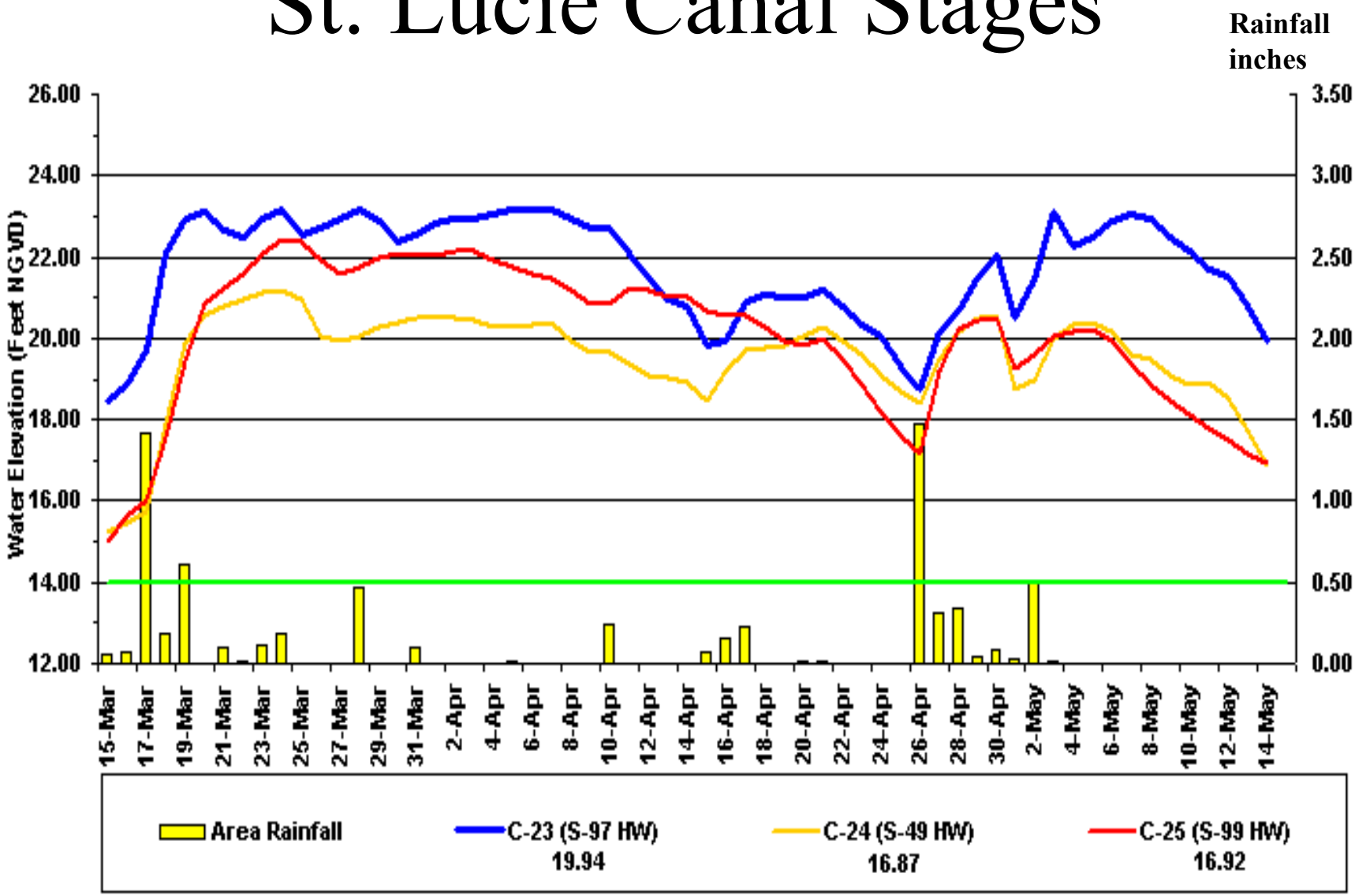


Groundwater Conditions

- Upper East Coast
  - Normal seasonal levels
- Lower East Coast
  - Normal seasonal levels
- Lower West Coast Region:
  - Mid-Hawthorn below normal seasonal levels

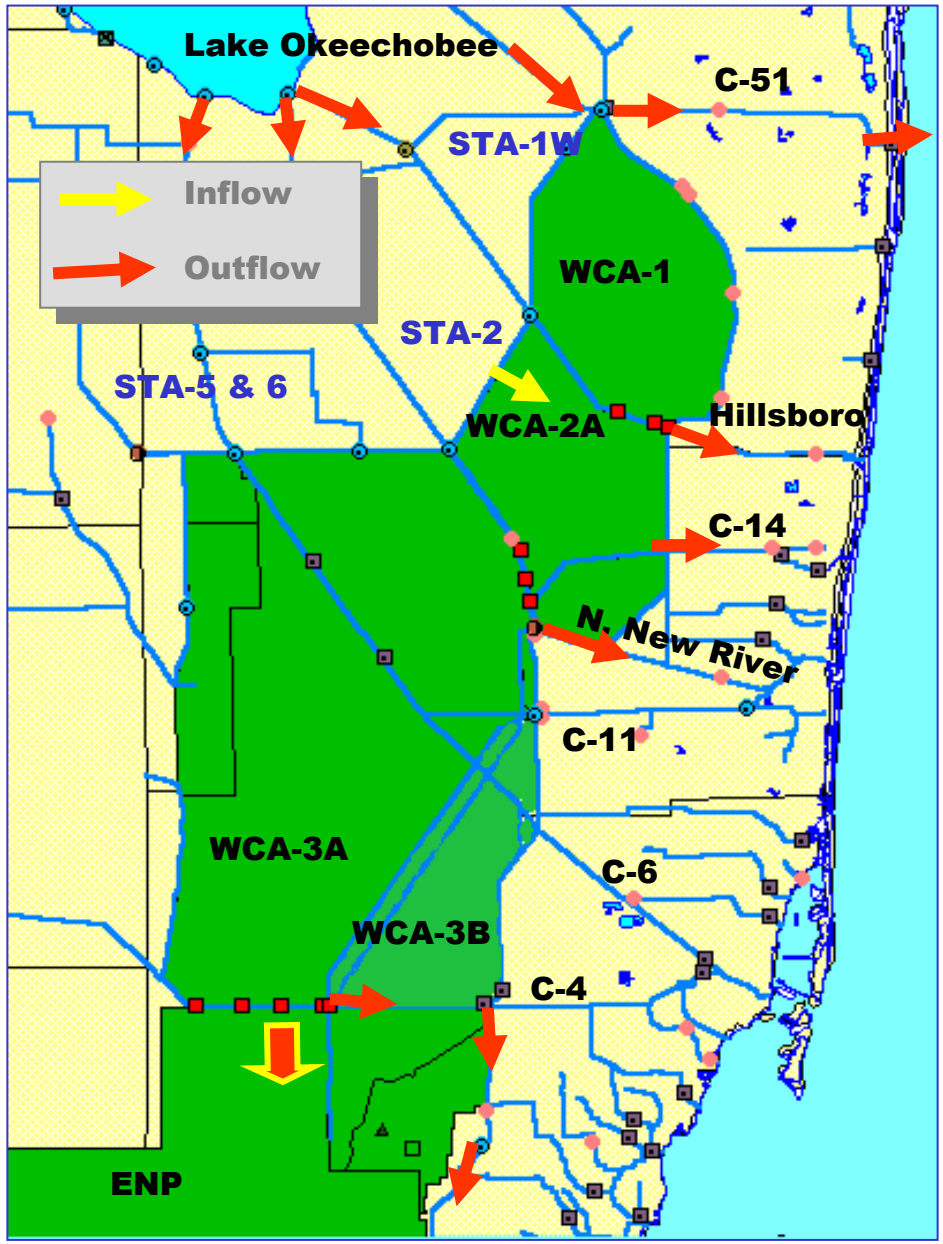


St. Lucie Canal Stages



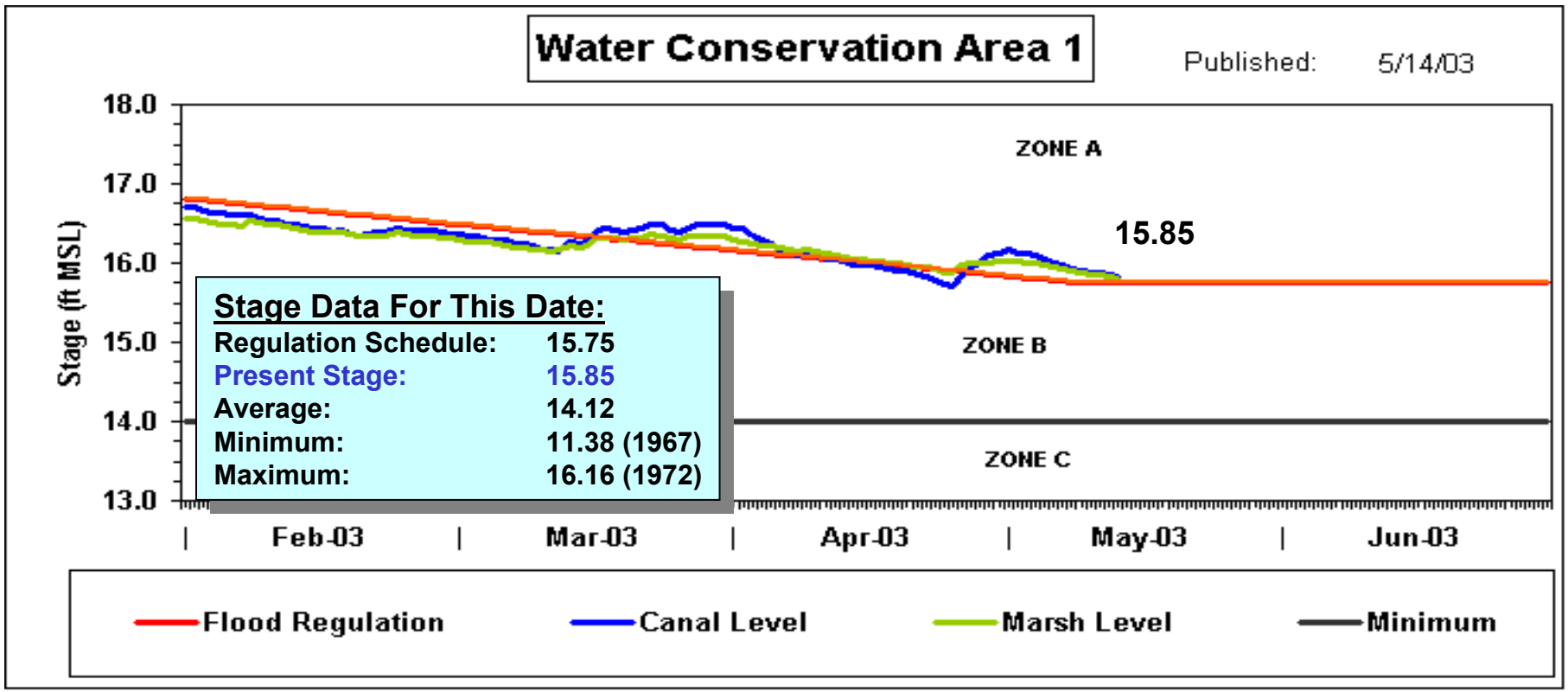
Water Conservation Areas

- WCA-1 stages slightly above schedule
- WCA-2A stages are at regulation schedule
- WCA-3A stages are in Zone E1 of the regulation schedule
  - Deliveries to Everglades National Park under the "Rainfall Plan"
  - IOP releases to SDCS



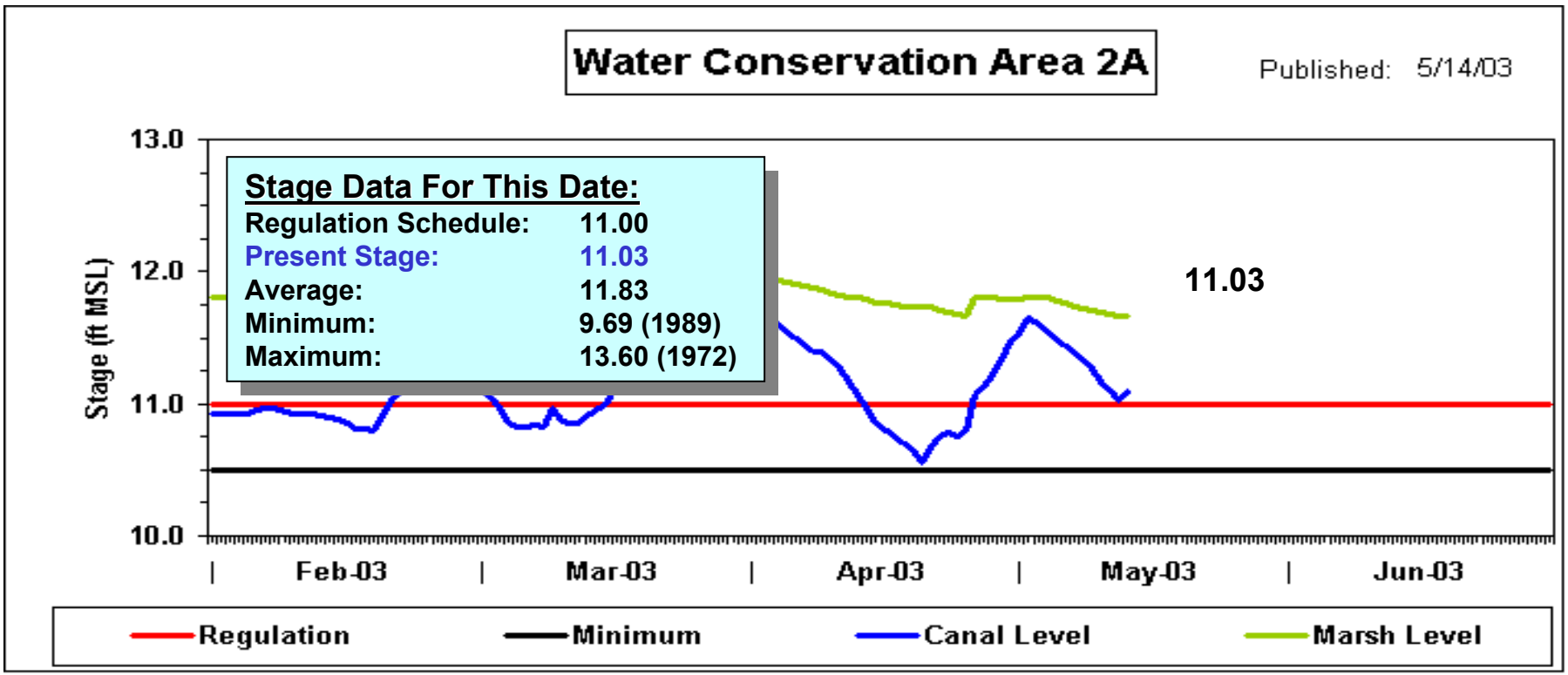
Hydrologic Conditions
Water Conservation Area No. 1

- Stages remain above regulatory schedule



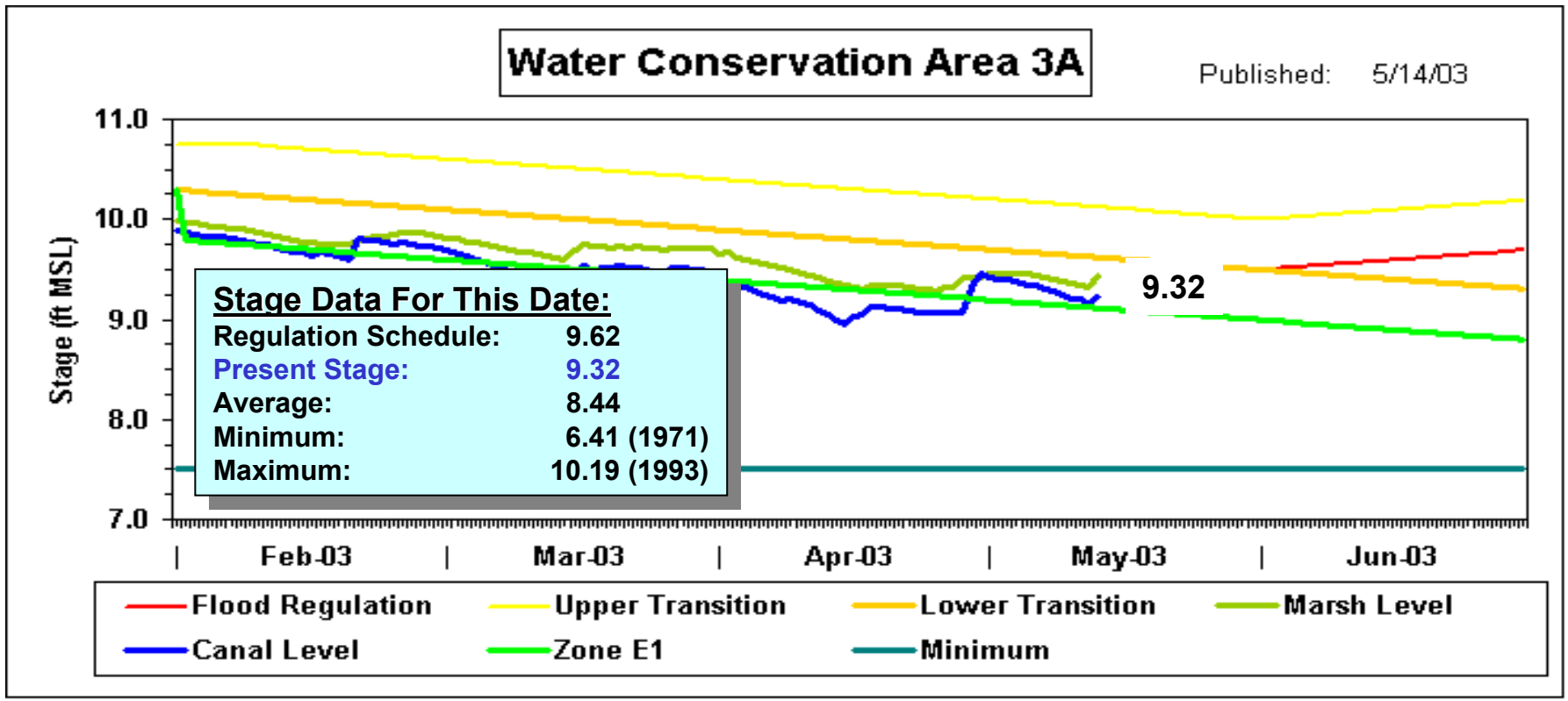
Hydrologic Conditions
Water Conservation Area No. 2A

- Above regulation schedule



Hydrologic Conditions
Water Conservation Areas

- Stages remain in Zone E1 under the Interim Operating Plan



Hydrologic Conditions
SDCS Current Operations

- Current Operations are following Column 2 of the IOP Criteria
  - Slightly lower canal stages than under Column 1 Criteria.
- Regulatory releases from WCA-3A to SDCS
  - Gravity discharge at S-331/S-173
  - Pumping to detention areas at S-332B & D

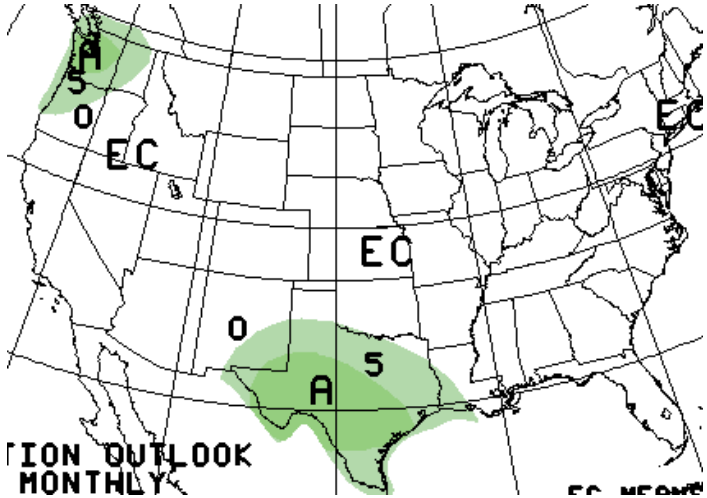
SDCS - IOP Current Operations

Climate Outlook

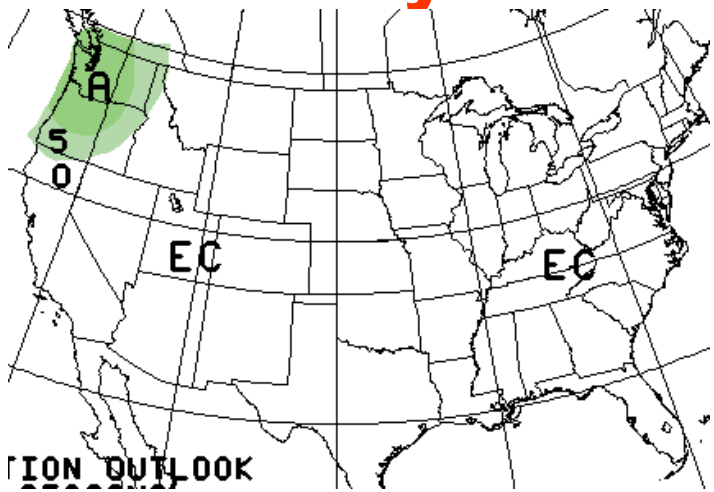
Governing Board Presentation - May 15, 2003

Seasonal Climatic Outlook

- CPC reports that March thru May 2003 has an "equal" probability of above average, average, or below average precipitation



May



May-Jun-Jul

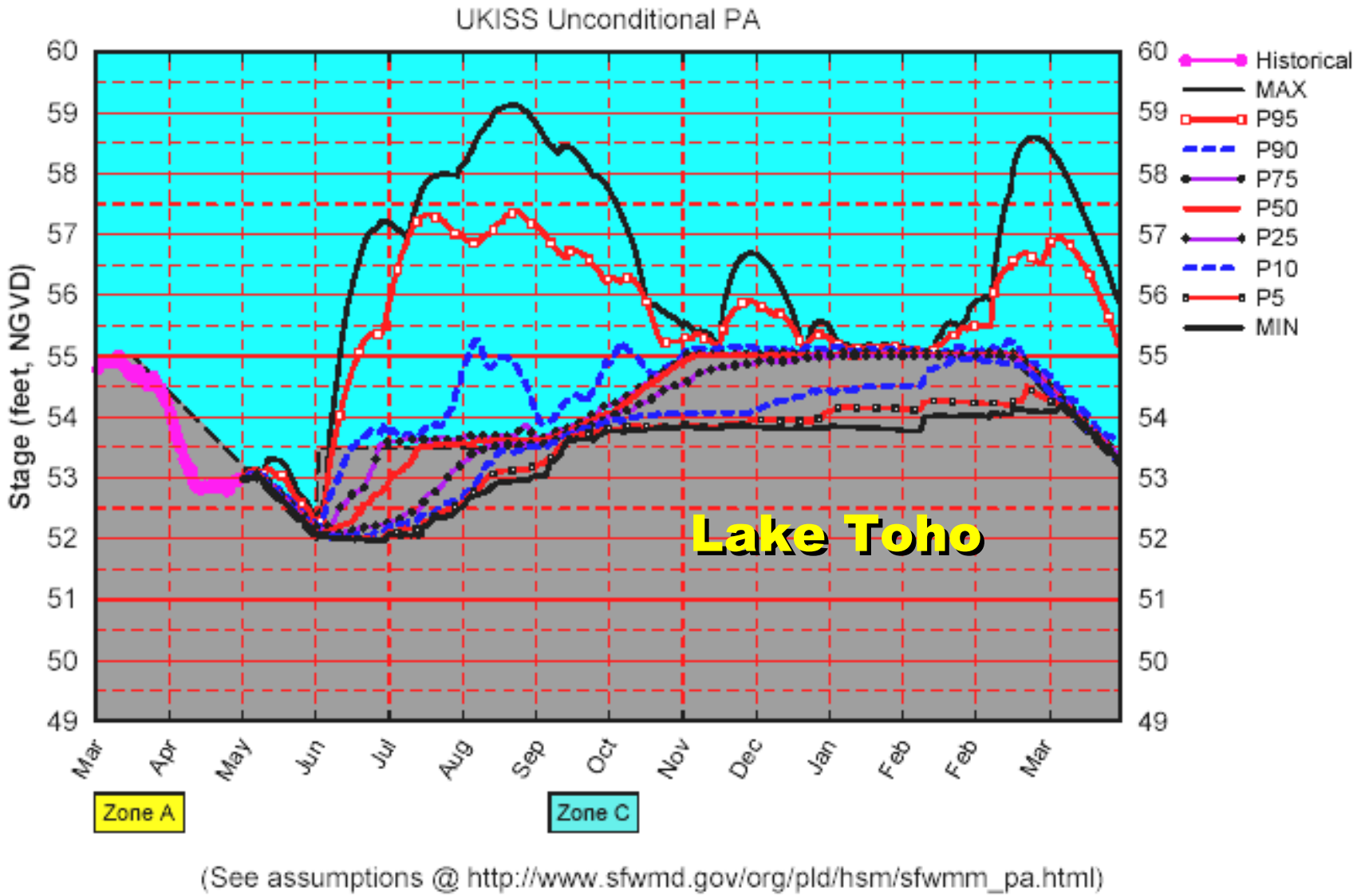
Wet Season Forecast

- National Weather Service
  - Indicated that in past years when transitioning out of an El Nino, wet season rainfall in the Miami region could be 2 inches below normal
  - If the peninsula were not affected by a tropical system this deficit could approach 12 to 15 inches
- SFWMD review of the District-wide historical record indicates no statistically significant correlation between ENSO events and *wet season* rainfall

Hydrologic Outlook

Governing Board Presentation - May 15, 2003

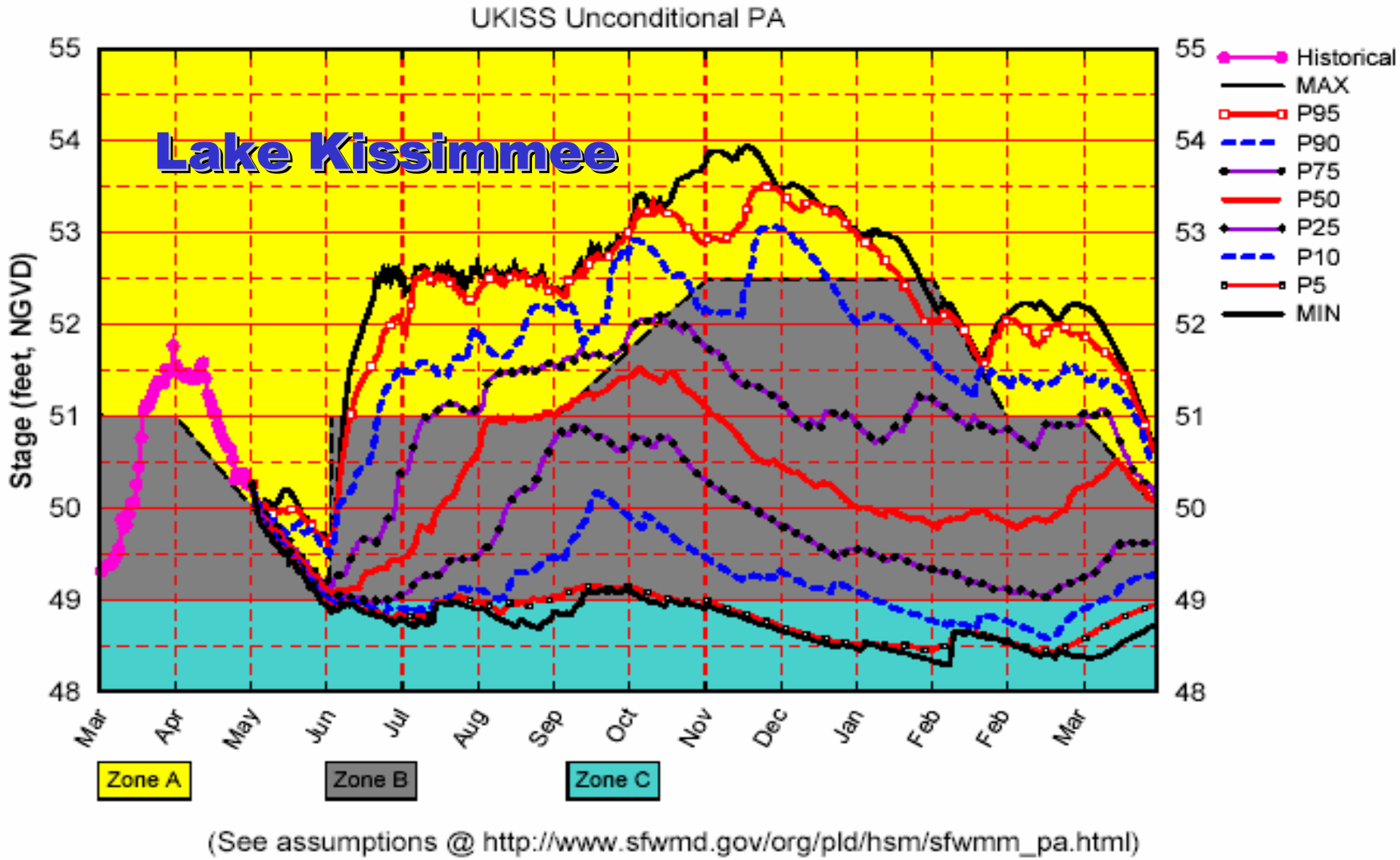
S61 UKISS May 2003 Position Analysis



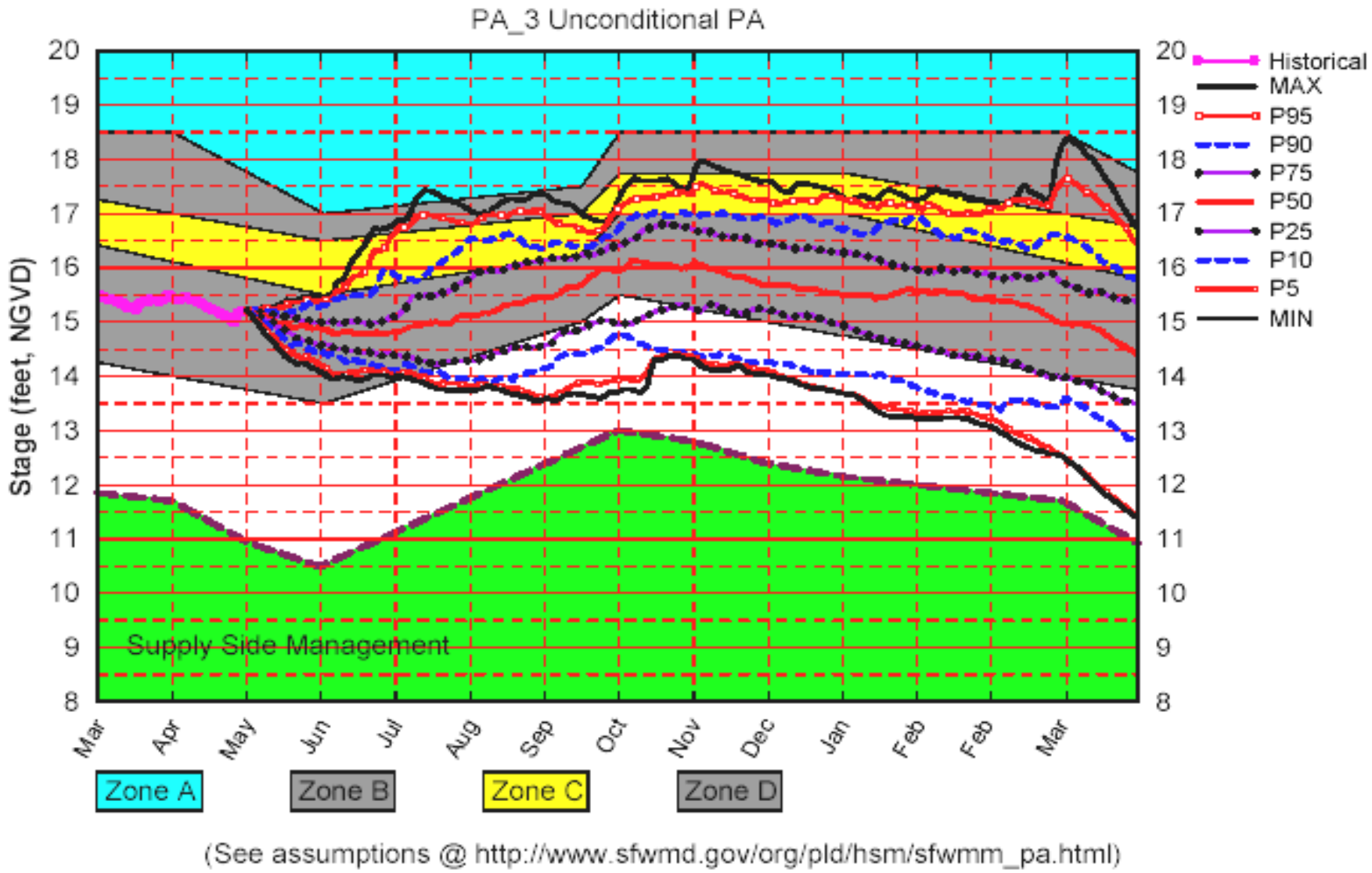
(See assumptions @ http://www.sfwmd.gov/org/pld/hsm/sfwmm_pa.html)

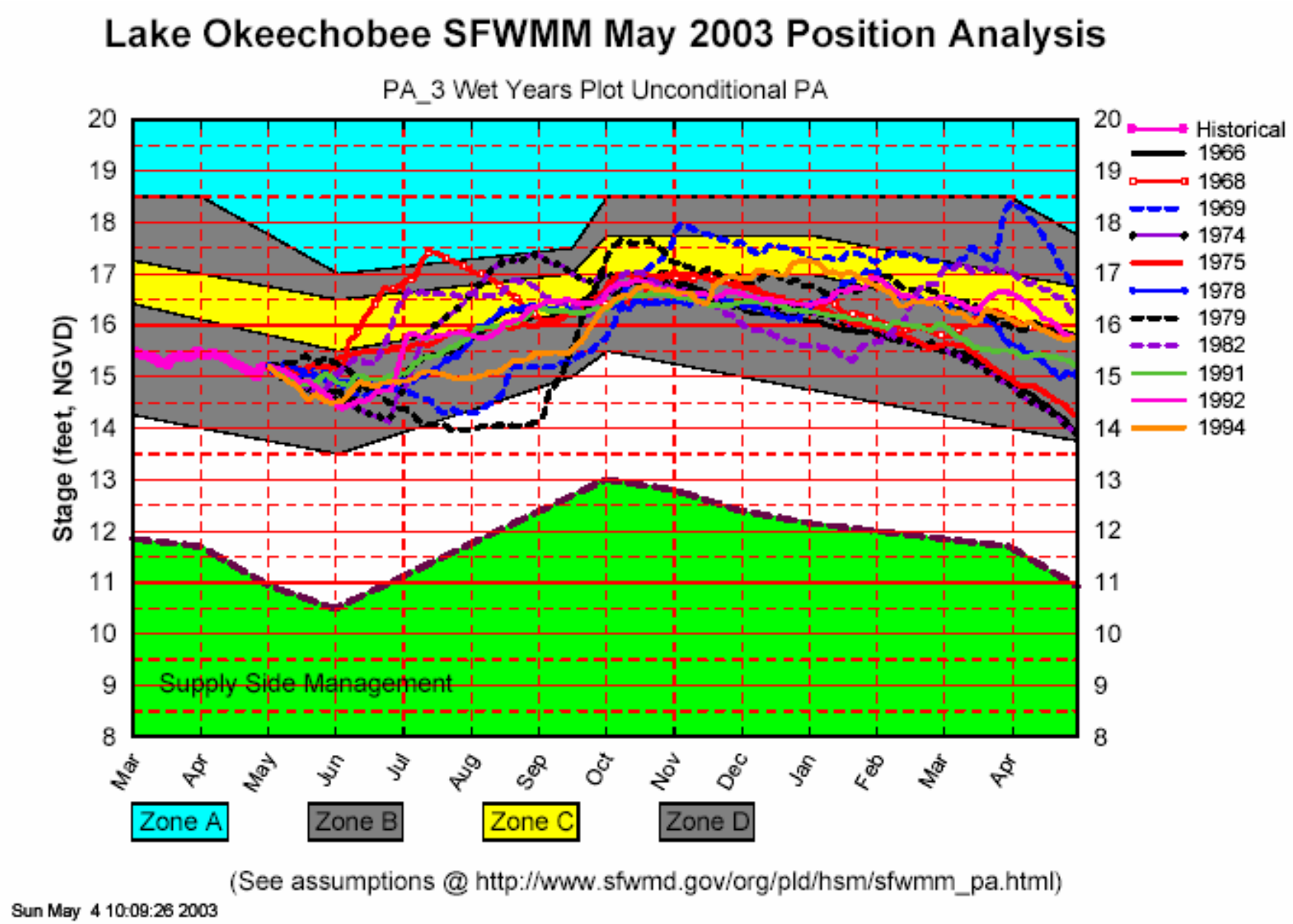
Wed Apr 30 15:28:25 2003

S65 UKISS May 2003 Position Analysis

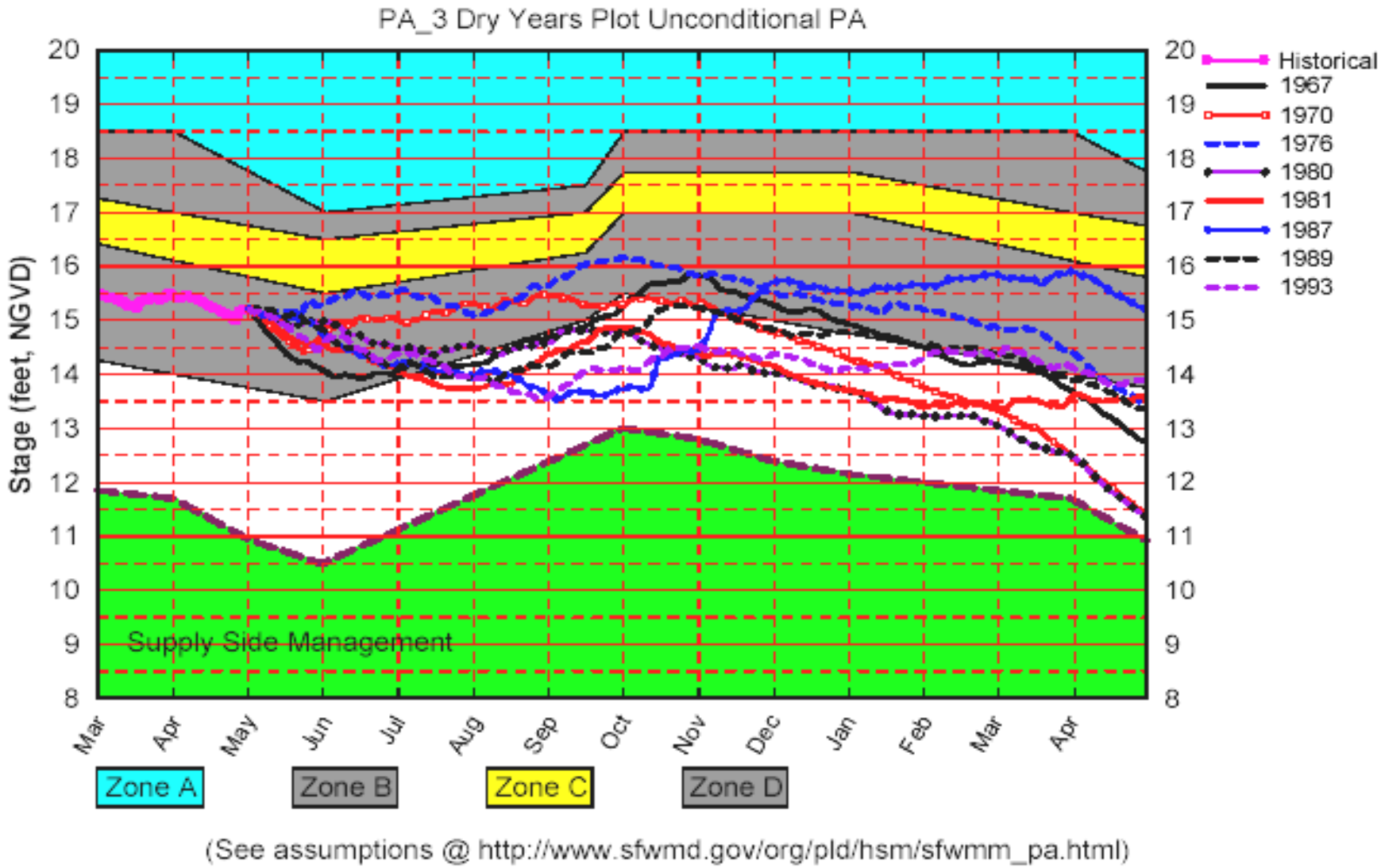


Lake Okeechobee SFWMM May 2003 Position Analysis




Lake Okeechobee SFWMM May 2003 Position Analysis
PA_3 Wet Years Plot Unconditional PA
Stage (feet, NGVD)
20
19
18
17
16
15
14
13
12
11
10
9
8
Historical
1966
1968
1969
1974
1975
1978
1979
1982
1991
1992
1994
Supply Side Management
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Jan
Feb
Mar
Apr
Zone A
Zone B
Zone C
Zone D
(See assumptions @ http://www.sfwmd.gov/org/pld/hsm/sfwmm_pa.html)
Sun May 4 10:09:26 2003

Lake Okeechobee SFWMM May 2003 Position Analysis



Operational Outlook

Governing Board Presentation - May 15, 2003

Operational Outlook

- The Statistical “Position Analysis” for Lake Okeechobee indicates…
  - a very low probability of water shortage restrictions in the lake service area
  - Virtually no chance that stages will reach or fall below 13.5 ft. NGVD by June 1st
  - Less than a 5% chance that stages will equal or exceed 15.5 ft. NGVD by June 1st

Governing Board Presentation - May 15, 2003